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LOW IRON LEVELS MAY PLAY A KEY ROLE IN LONG COVID

Patients who continued to develop long COVID had more deficiencies in blood **iron regulation,** including anemia at 2 weeks after acute infection. This suggests that low iron levels could play a role in chronic impairment, according to a new study in Nature Immunology.

The study relied on blood samples from 214 patients collected through the Cambridge Institute of Therapeutic Immunology and Infectious Disease. All participants provided multiple blood samples during and after a COVID-19 infection for 12 months.

Researchers found that long forms of COVID were associated with **inflammation modulation** and low iron levels after acute infection. Individuals with marked inflammatory syndrome, lower blood iron levels, and more severe initial infections had an increased risk of long COVID.

Iron dysregulation occurs after all infections, explained the authors, as iron is rapidly moved out of the bloodstream to prevent the proliferation of certain bacteria.

If this persists, there is less iron for red blood cells, resulting in less efficient **oxygen transport affecting metabolism and energy production,** as well as for white blood cells, which need iron to function properly, thus the protective mechanism becomes problematic.

All study participants were enrolled in August 2020 and were classified into five groups: 18 individuals with asymptomatic infections (Group A), 40 with mild symptomatic infections (Group B), 48 with moderate infections not requiring **oxygen therapy** (Group C), 39 with moderate infections requiring supplemental oxygen (Group D), and 69 individuals with severe infections requiring ventilation (Group E).

Blood samples were collected from participants over six time periods (days 0 to 14, 15 to 30, 31 to 90, 91 to 180, and 181 to 360 post-onset) and were compared with healthy COVID-19 negative controls.

For participants requiring minimal supplemental oxygen, levels of C-reactive protein and cytokines remained elevated for weeks and months longer than healthy controls or those with mild infections.

Hepcidin was also increased in the blood of moderate to severe COVID-19 groups on days 0 to 14 compared to healthy controls. Increased hepcidin is a feature of inflammatory anemia or low blood oxygen.

Iron dysregulation and hypoxia may support a destructive cycle of impaired immune function, poor viral control, and inflammation contributing to the specific tissue and systemic manifestations of severe acute COVID-19 and potential disruption of long-term immune memory, and fatigue and exercise intolerance, two distinctive symptoms in **long COVID**, may be related to poor iron regulation.

Supplementation with iron during the acute phase of COVID-19 infection or its potential in the treatment of long COVID can thus be justified, with this hypothesis requiring confirmation.

Adapted after Stephanie Soucheray, MA, 4 March 2024